Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of claims

Claim 1: (currently amended) A method of recovering management of one or more network elements, said method comprising:

communicatively coupling the one or more network elements with at least one a plurality of distributed gateways;

communicatively coupling the at least one distributed gateway with at least one gateway monitoring system;

communicatively coupling the at least one gateway monitoring system with a central management system;

monitoring operation, by the at least one gateway monitoring system, of [[a]] the plurality of distributed gateways, each of [[said]] the plurality of distributed gateways responsible for managing the one or more network elements;

detecting failure by the at least one gateway monitoring system, of one of [[said]] the plurality of distributed gateways;

receiving a notice of the detected failure from the at least one gateway monitoring system at [[a]] the central management system; and

responsive to said receiving step, recovering, by the central management system, management of [[said]] the one or more network elements for which [[said]] the failed one of the plurality of distributed gateways [[gateway]] had management responsibility by assigning management responsibility to at least one other of [[said]] the plurality of distributed gateways.

Claim 2: (currently amended) The method of claim 1 wherein said managing the one or more network elements includes translating from one [[a]] communication protocol utilized by [[said]] the one or more network elements to another communication protocol.

Claim 3: (original) The method of claim 1 wherein said plurality of distributed gateways are communicatively coupled to a processor-based management system.

Claim 4: (original) The method of claim 3 further comprising the step of:

said management system controlling said recovering step.

Claim 5: (cancelled)

Claim 6: (currently amended) The method of claim [[5]] 1 wherein said detecting step further includes the step of: said one or more gateway monitoring systems polling said plurality of distributed gateways.

Claim 7: (currently amended) The method of claim [[5]] 1 further comprising the step of:

said one or more gateway monitoring systems controlling said recovering step.

Claim 8: (original) The method of claim 1 further comprising the step of:

determining management activities for which a detected failed gateway is responsible for performing.

Claim 9: (original) The method of claim 8 further comprising the step of:

determining one or more available gateways from said plurality of distributed gateways, which are available for assuming at least a portion of said management activities of said detected failed gateway.

Claim 10: (original) The method of claim 9 wherein said one or more available gateways are a subset of said plurality of distributed gateways.

Claim 11: (original) The method of claim 9 wherein said available gateways are gateways local to said detected failed gateway.

Claim 12: (original) The method of claim 9 further comprising the step of:

grouping two or more of said plurality of distributed gateways.

Claim 13: (original) The method of claim 12 wherein said step of determining one or more available gateways, includes determining gateways that are included in a common grouping with said detected failed gateway.

Claim 14: (original) The method of claim 12 wherein said grouping is predetermined based at least in part on a criteria selected from the group consisting of:

gateway communication protocol, gateway location, and any user-defined criteria.

Claim 15: (original) The method of claim 9 wherein said recovering step further includes the step of:

distributing said management activities of said detected failed gateway to at least one of said one or more available gateways.

Claim 16: (original) The method of claim 15 wherein said distributing step further includes the steps of:

determining operational load of said available gateways; and

performing load balancing in distributing said management activities to said at least one of said one or more available gateways.

Claim 17: (original) The method of claim 16 wherein said load balancing is performed autonomously by a processor-based system.

Claim 18: (original) The method of claim 17 wherein said load balancing further comprises the steps of:

determining the operational load for each of said management activities; and

allocating said management activities to one or more of said available gateways in a manner that approximately balances each of their operational loads.

Claim 19: (original) The method of claim 18 wherein said operational load of said available gateways is determined dynamically, and allocation of said management activities is determined based at least in part on said determined operational load of said available gateways.

Claim 20: (original) The method of claim 17 wherein said load balancing is performed according to a greedy algorithm.

Claim 21: (original) The method of claim 8 wherein said recovering step further includes the step of:

distributing said management activities of said detected failed gateway to at least one other of said plurality of distributed gateways.

Claim 22: (original) The method of claim 21 wherein said distributing step is autonomously performed by a processor-based system.

Claim 23: (original) The method of claim 21 wherein said distributing step further includes the steps of:

determining operational load of said available gateways; and

performing load balancing in distributing said management activities to said at least one other of said plurality of distributed gateways.

Claim 24: (currently amended) The method of claim 1 wherein said plurality of distributed gateways are operable to translate from one [[a]] plurality of different communication protocols to another plurality of different communication protocols.

Claim 25: (original) The method of claim 1 further comprising the step of:

user predefining at least one of said plurality of distributed gateways to be used in recovering management of one or more network elements for which a particular one of said plurality of distributed gateways has management responsibility in the event of a failure of said particular one of said plurality of distributed gateways.

Claim 26: (original) The method of claim 1 further comprising the step of:

user predefining criteria to be used in recovering management of one or more network elements in the event of a failure of one of said plurality of distributed gateways.

Claim 27: (original) A system comprising:

plurality of network elements;

plurality of distributed gateways each communicatively coupled to one or more of said plurality of network elements, wherein each of said plurality of distributed gateways is responsible for managing one or more of said plurality of network elements;

gateway monitoring system communicatively coupled to said plurality of distributed gateways, wherein said gateway monitoring system is operable to detect failure of at least one of said distributed gateways; and

management recovery system communicatively coupled to said plurality of distributed gateways,

wherein said management recovery system is operable to autonomously recover management of said one or more network elements for which a detected failed gateway had management responsibility.

Claim 28: (original) The system of claim 27 wherein said management recovery system is operable to assign management responsibility of said one or more network elements for which said detected failed gateway had management responsibility to at least one other of said plurality of distributed gateways.

Claim 29: (currently amended) The system of claim 27 wherein said managing one or more of said network elements includes translation [[of a]] <u>from one</u> communication protocol utilized by said one or more network elements <u>to another communication protocol</u>.

Claim 30: (original) The system of claim 27 wherein said gateway monitoring system and said management recovery system are integrated on a common platform.

Claim 31: (original) The system of claim 27 wherein said gateway monitoring system is operable to poll said plurality of distributed gateways.

Claim 32: (original) The system of claim 27 wherein said management recovery system is operable to determine management activities for which said detected failed gateway is responsible for performing.

Claim 33: (original) The system of claim 32 wherein said management recovery system is operable to determine one or more available gateways from said plurality of distributed gateways, which are available for assuming at least a portion of said management activities of said detected failed gateway.

Claim 34: (original) The system of claim 33 wherein said one or more available gateways are a subset of said plurality of distributed gateways.

Claim 35: (original) The system of claim 33 wherein said available gateways are gateways local to said detected failed gateway.

Claim 36: (original) The system of claim 33 wherein said available gateways are gateways operable to translate a common communication protocol as said detected failed gateway.

Claim 37: (original) The system of claim 33 wherein said management recovery system is further operable to distribute said management activities of said detected failed gateway to at least one of said one or more available gateways.

Claim 38: (original) The system of claim 37 wherein said management recovery system is operable to determine operational load of said available gateways, and perform load balancing in distributing said management activities to said at least one of said one or more available gateways.

Claim 39: (original) The system of claim 38 wherein in performing said load balancing said management recovery system is operable to determine the operational load for each of said management activities, and allocate said management activities to one or more of said available gateways in a manner that approximately balances each of their operational loads.

Claim 40: (original) The system of claim 38 wherein said management recovery system further comprises:

software code executable by said management recovery system, said software code implementing a greedy algorithm for controlling said load balancing.

Claim 41: (original) The system of claim 27 wherein said management recovery system further comprises:

software code executable by said management recovery system to present a user interface for alerting a user of said detected failed gateway.

Claim 42: (original) The system of claim 27 wherein said management recovery system further comprises:

software code executable by said management recovery system to present a user interface that enables a user to predefine at least one of said plurality of distributed gateways to be used in recovering management of one or more network elements for which a particular one of said plurality of distributed gateways has management responsibility in the event of a failure of said particular one of said plurality of distributed gateways.

Claim 43: (original) The system of claim 27 wherein said management recovery system further comprises:

software code executable by said management recovery system to present a user interface that enables a user to predefine criteria to be used in recovering management of one or more network elements in the event of a failure of one of said plurality of distributed gateways.

Claim 44: (currently amended) A system for recovering management of one or more network elements responsive to failure of a distributed gateway, said system comprising:

plurality of distributed gateways, each for managing one or more network elements;

[[means]] a gateway monitoring system communicatively coupled to said plurality of distributed gateways, said gateway monitoring system capable of [[for]] detecting failure of anyone of said distributed gateways;

means communicatively ~~couple~~ coupled to said gateway monitoring system ~~means for detecting failure~~ for receiving a notice of the detected failure at a central management system; and

means, responsive to said means for receiving a notice of the ~~detection of~~ detected failure of one of said distributed gateways, for autonomously recovering, by the central management system, management of one or more network elements for which the detected failed gateway had management responsibility.

Claim 45: (original) The system of claim 44 wherein the means for autonomously recovering management comprises logic for assigning management responsibility of said one or more network elements for which said detected failed gateway had management responsibility to at least one other of said plurality of distributed gateways.

Claim 46: (original) The system of claim 45 wherein said logic includes software code executable by said means for autonomously recovering management.

Claim 47: (currently amended) The system of claim 44 wherein said managing one or more network elements includes translation [[of a]] from one communication protocol utilized by said one or more network elements to another communication protocol.

Claim 48: (original) The system of claim 44 wherein said means for detecting failure comprises logic for polling said plurality of distributed gateways.

Claim 49: (original) The system of claim 48 wherein said logic includes software code executable by said means for detecting failure.

Claim 50: (original) The system of claim 44 further comprising:

means for determining management activities for which said detected failed gateway is responsible for performing.

Claim 51: (original) The system of claim 50 further comprising:

means for determining one or more available gateways from said plurality of distributed gateways, which are available for assuming at least a portion of said management activities of said detected failed gateway.

Claim 52: (original) The system of claim 51 wherein said one or more available gateways are a subset of said plurality of distributed gateways.

Claim 53: (original) The system of claim 51 wherein said available gateways are determined as gateways local to said detected failed gateway.

Claim 54: (original) The system of claim 51 wherein said available gateways are determined as gateways operable to translate a common communication protocol as said detected failed gateway.

Claim 55: (original) The system of claim 51 wherein said means for autonomously recovering management comprises logic for allocating said management activities of said detected failed gateway to at least one of said one or more available gateways.

Claim 56: (original) The system of claim 55 further comprising:

means for determining operational load of said available gateways, wherein said means for autonomously recovering management comprises logic for perfom1ing load balancing in allocating said management activities to said at least one of said one or more available gateways.

Claim 57: (original) The system of claim 56 further comprising:

means for determining the operational load for each of said management activities, wherein said means for autonomously recovering management comprises logic for allocating said management activities to one or more of said available gateways in a manner that approximately balances each of their operational loads.

Claim 58 (new): The method of claim 1 wherein said step of detecting further comprises the steps of:

determining at least one type of the failure;

distinguishing at least one source of the failure selected from the group consisting of hardware failures, software failures, and communication port failures;

presenting to the user at least one reason for the failure based on the at least one type of the failure and the at least one source of the failure;

presenting to the user at least one action that could be taken by the central management system to resolve the at least one failure; and

receiving at least one selection of the at least one action.